

## CLAIMS

I Claim:

1. For a system capable of transmitting data from a database maintained by a server system to a client, the database comprising one or more data objects representing one or more individuals, a computer-readable medium having stored thereon a data structure for representing the data so as to reduce latency when transmitting the data, the data structure comprising:

a plurality of nodes, each representing an associated data object which stores an object identifier, relationship data describing how an individual corresponding to the data object is related to one or more other individuals, and at least one of name, date, and place data for the corresponding individual, wherein the plurality of nodes are grouped into one or more levels within a hierarchical chart; and

for each one of the plurality of nodes, a plurality of data fields comprising an object identifier field and one or more relationship fields which reference one or more other nodes in one or more levels of the hierarchical chart, but wherein the plurality of data fields exclude at least some name, date or place data that is stored in the data object represented by the node in order to reduce latency that would otherwise occur when sending or receiving the plurality of nodes, wherein the one or more relationship fields uniquely identify each object represented by each node, without having to reference the at least some name, date, or place data that has been excluded from each node.

2. A data structure as defined in claim 1, wherein the object is an individual.

3. A data structure as defined in claim 1, wherein the plurality of nodes represents genealogical data.

4. A data structure as defined in claim 1, wherein the plurality of nodes represents multi-level marketing data.

5. A data structure as defined in claim 1, wherein the plurality of data fields further comprises:

one or more next level pointers, the next level pointers referencing one or more nodes in a next level; and

one or more previous level pointers, the previous level pointers referencing one or more nodes in a previous level.

6. A data structure as defined in claim 1, wherein the plurality of data fields further comprise:

a next pointer, the next pointer referring to a next node in the same level;

a previous pointer, the previous pointer referring to a previous node in the same level;

a level data field, the generation field identifying a level of each node; and

a y position field for positioning each node within each level on a display device, wherein the next pointer, the previous pointer, the level data field and the y position field are generated at the client.

7. In a system having a server system maintaining a database containing data for a plurality of individuals, the data for each individual comprising (i) at least some name, date, or place data associated with the individual, (ii) one or more relationships to one or more other individuals, and (iii) an individual identifier, a method of transferring at least a portion of the data from the database to a client that reduces latency which otherwise may be associated with the transfer, the method comprising the steps of:

requesting, by a client, data for one or more individuals from a server system;

in response to the request, receiving, from the server system, a plurality of nodes representative of the one or more individuals whose data has been requested by the client, but containing only an initial portion of the requested data by having excluded at least some available name, date, or place data to reduce latency that would otherwise occur from waiting for the excluded data, wherein the initial portion comprises an individual identifier and one or more links to one or more other nodes based on one or more relationships that an individual has to one or more other individuals;

from the one or more links in each node, expanding the plurality of nodes at the client to produce a client data structure representative of the requested data; and  
for one or more selected nodes, receiving a subsequent portion of the requested data that comprises at least some of the name, date, or place data which was excluded from the received nodes to reduce latency.

8. A method as defined in claim 7, wherein the client data structure is a pedigree chart representative of genealogical data.

9. A method as defined in claim 7, wherein the client data structure is a chart representative of multi-level marketing data.

10. A method as defined in claim 7, wherein the each of the plurality of nodes comprises one or more server data fields.

11. A method as defined in claim 10, wherein the one or more server data fields are expanded at the client to generate additional client data fields.

12. A method as defined in claim 11, wherein the server data fields and the client data fields define relationships between the plurality of nodes.

13. For a system capable of transmitting genealogical data from a database stored by a server to a client, the database comprising one or more data objects representing one or more individuals, a computer-readable medium having stored thereon a data structure for representing the genealogical data so as to reduce latency when transmitting the data, the data structure comprising:

a plurality of nodes, each representing an individual in a pedigree chart, the individual having at least one of name, date, and place data associated with the individual, wherein one of the plurality of nodes is an anchor node, and wherein the plurality of nodes are grouped into one or more generations of the pedigree chart; and

for each one of the plurality of nodes, a plurality of data fields comprising an individual identifier field and one or more relationship fields which reference one or more other nodes in the one or more generations of the pedigree chart, but wherein the plurality of data fields exclude at least some name, date, or place data that is associated with the individual in order to reduce latency that would otherwise occur when transferring the plurality of nodes, wherein the one or more relationship fields uniquely identify each individual represented by each node, without having to reference the at least some name, date, or place data that has been excluded from each node.

14. A data structure as defined in claim 13, wherein the anchor node comprises the first generation of the pedigree chart.

15. A data structure as defined in claim 13, wherein each of the one or more generations comprises at least one node.

16. A data structure as defined in claim 13, wherein the plurality of data fields further comprises:

a father pointer, the father pointer referencing a node in a next generation;

a mother pointer, the mother pointer referencing a node in the next generation; and

a child pointer, the child pointer referencing a node in a previous generation.

17. A data structure as defined in claim 13, wherein the plurality of data fields further comprises a flags field, the flags field capable of representing characteristics of the individual represented by each node.

18. A data structure as defined in claim 13, wherein the plurality of data fields further comprises an identifier field, the identifier field uniquely identifying the individual represented by each node from all other individuals stored on the database.

19. A data structure as defined in claim 13, wherein the plurality of data fields further comprise:

a next pointer, the next pointer referring to a next node in the same generation;

a previous pointer, the previous pointer referring to a previous node in the same generation;

a generation data field, the generation field identifying a generation of each node; and

a y position field for positioning each node within each generation on a display device, wherein the next pointer, the previous pointer, the generation data field, and the y position field are generated at the client.

20. In a system having a server maintaining a database containing genealogical data for a plurality of individuals, the genealogical data for each individual comprising at least some name, date, or place data associated with the individual, one or more relationships to one or more other individuals, and an individual identifier, wherein the genealogical data is accessible by a client, a method for transferring the genealogical data from the database to a client, the method comprising the acts of:

requesting, by a client, genealogical data associated with a plurality of individuals from a server;

in response to the request, receiving, from the server, a plurality of nodes representative of the plurality of individuals whose genealogical data has been requested by the client, but containing only an initial portion of the request data, the initial portion excluding at least some available name, date, or place data for one or more individuals to reduce latency that would otherwise occur from receiving the excluded data with the initial portion, wherein for each of the plurality of individuals represented by the plurality of nodes, the initial portion comprises one or more relationships to one or more other individuals;

from the one or more relationships for each of the plurality of individuals, expanding the plurality of nodes at the client to produce a client data structure representative of a pedigree chart; and

for one or more selected nodes, requesting and receiving a subsequent portion of the requested genealogical data from the database that comprises at least some of the name, date, or place data which was excluded from the received plurality of nodes to reduce latency.



21. A method as defined in claim 20, wherein the plurality of nodes are generated by the server and form a server data structure having one or more generations, wherein the nodes in adjacent generations are linked.

22. A method as defined in claim 21, wherein the server data structure is expanded to generate the client data structure having one or more generations, wherein the nodes in a same generation are linked together and the nodes in adjacent generations are linked.

23. A method as defined in claim 20, wherein each individual represented by each node is identified by family relationships.

24. A method as defined in claim 22 wherein each of the plurality of nodes in the server data structure comprises one or more data fields, the one or more server data fields comprising:

a father pointer for indicating a node in a next generation representative of a father if known;

a mother pointer for indicating a node in a next generation representative of a mother if known;

a child pointer for indicating a node in a previous generation representative of a child if known;

a flag data field for representing characteristics of the individual associated with the node; and

an identifier data field for uniquely identifying the individual from all other individuals.

25. A method as defined in claim 24, wherein each of the plurality of nodes of the client data structure comprises:

the one or more server data fields of the server data structure; and

one or more client data fields comprising:

a next pointer for identifying a next node in a same generation;

a previous pointer for identifying a previous node in the same generation; and

a y position node for positioning the nodes of the same generation on a display device.

26. A method as defined in claim 21, wherein the server data structure is expanded to generate the client data structure.

27. A method as defined in claim 25, wherein the act of expanding the plurality of nodes further comprises the acts of:

determining a generation data field for each node;

determining the y position data field for each node; and

determining the next and previous pointer data fields based on the y position data fields of nodes having the same generation data field.

28. A method as defined in claim 20 further comprising the act of displaying the genealogical information for each node selected by a user.

29. In a system having a client capable of receiving genealogical data from a database through a server, wherein for each of one or more individuals the database comprises at least some name, date, or place data for the individual, relationship data describing how the individual is related to one or more other individuals, and an individual identifier, a method for displaying a pedigree chart at the client, the method comprising the steps of:

receiving a plurality of nodes from the server, wherein the plurality of nodes are representative of individuals in the pedigree chart, but contain only an initial portion of data associated with the individuals, wherein for each node the initial portion comprises an individual identifier and one or more relationships to one or more other nodes representing one or more other individuals, but excludes at least some associated genealogical data to reduce latency that would otherwise occur from receiving the excluded data with the initial portion;

from the one or more relationships in each node, expanding the plurality of nodes at the client to generate a client data structure representative of the pedigree chart;

in response to a user selecting one of the nodes in the client data structure, retrieving at least a portion of the excluded genealogical data associated with the selected node from the database; and  
displaying the at least a portion of the excluded genealogical information associated with the selected node at the client.

30. A method as defined in claim 29, wherein the step of receiving a plurality of nodes from the server further comprises the steps of:

generating, by the server, the plurality of nodes in response to a request for genealogical data from the client; and

linking the plurality of nodes according to family relationships.

31. A method as defined in claim 30, wherein the step of linking the plurality of nodes further comprises the step of generating a plurality of server data fields for each node.

32. A method as defined in claim 31, wherein the server data fields comprise:

a father pointer data field pointing to a father node in a next generation;

a mother pointer data field pointing to a mother node in the next generation;

a child pointer data field pointing to a child node in a previous generation;

a flags data field; and

an identification data field for uniquely identifying the individual from all other individuals stored in the database.

33. A method as defined in claim 32, wherein the server data fields are compressed before the plurality of nodes is transmitted to the client.

34. A method as defined in claim 29, wherein the step of expanding the plurality of nodes further comprises the steps of:

generating client data fields for each of the nodes, the client data fields comprising:

a next pointer pointing to a next node in a same generation;

a previous pointer pointing to a previous pointer in the same generation;

a generation data field to identify a generation of each node; and

a y position field to position, at the client, all nodes having identical generation data fields.

35. A method as defined in claim 29, wherein the client data structure is a linked data structure representative of genealogical information requested by the client.

36. A method as defined in claim 29, wherein the client data structure does not contain genealogical data.

37. A method as defined in claim 29, wherein a user selects a node with a mouse over.

38. A method as defined in claim 29, wherein the genealogical data retrieved by the client is cached by the client.

39. A computer program product for implementing, in a system having a client capable of accessing a genealogical database through a server, wherein for each of one or more individuals the database comprises at least some name, date, or place data for the individual, relationship data describing how the individual is related to one or more other individuals, and an individual identifier, a method for displaying a pedigree chart at the client, the computer program product comprising:

a computer readable medium carrying computer executable instructions for implementing the method, wherein the computer executable instructions comprise:

receiving a plurality of nodes from the server, wherein the plurality of nodes are representative of individuals in the pedigree chart, but contain only an initial portion of data associated with the individuals, wherein for each node the initial portion comprises an individual identifier and one or more relationships to one or more other nodes representing one or more other individuals, but excludes at least some associated genealogical data to reduce latency that would otherwise occur from receiving the excluded data with the initial portion;

from the one or more relationships in each node, expanding the plurality of nodes at the client to generate a client data structure representative of the pedigree chart;

in response to a user selecting one of the nodes, retrieving at least a portion of the excluded genealogical data associated with the selected node from the database; and

displaying the at least a portion of the excluded genealogical information associated with the selected node at the client.